



# THE PUZZLING SIDE OF CHESS

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## CYCLOTRONIC OVERDRIVE: GEARING UP

number 89

April 17, 2015

This column features seven cyclotrons. Please buckle your seat belt. These puzzles sometimes spin out of control.



A *cyclotron* is a three-way switcheroo. Instead of switching two pieces, we switch three. Here are the rules.

### CYCLOTRONS

Switch the position of three pieces so that Black is in checkmate. No actual chess moves are made. The pieces simply swap squares.

The pieces trade places in a “cycle”. Piece A goes to square B, piece B goes to square C, and piece C goes to square A.

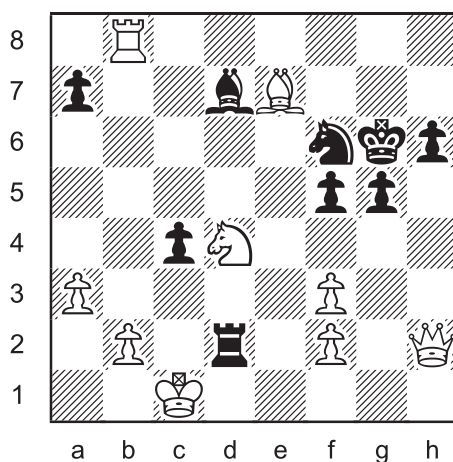
Any three pieces can trade places. Colours do not matter. The cycled pieces can be all white, all black, or a mix of both. Cycling the black king is a common trick.

The position after the cycle must be legal. This rule implies several things.

- a) A pawn cannot be on the 1st or 8th rank.
- b) Both kings cannot be in check.
- c) There must be a way to reach the position with a legal white move. Impossible checks, especially double checks, are a frequent “violation”.
- d) In some cases, retrograde analysis is required to decide if the position after a cycle is legal.

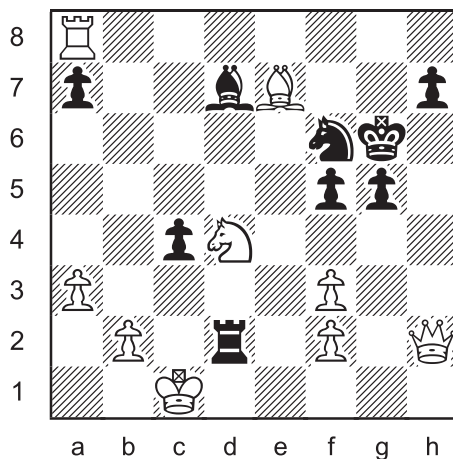
For more information on cyclotrons, see column 55.

### Cyclotron 16



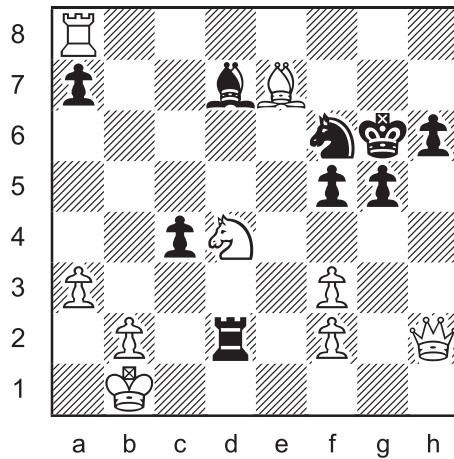
Cycle three pieces so that Black is in checkmate.

### Cyclotron 17



Cycle three pieces so that Black is in checkmate.

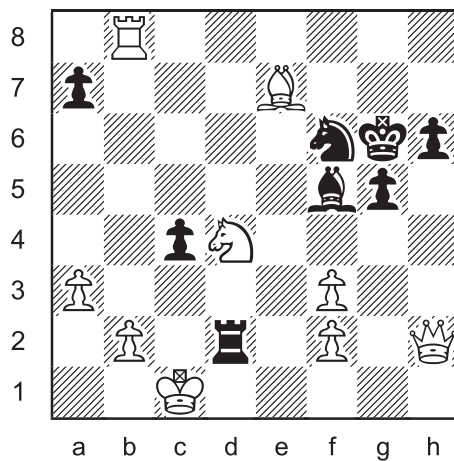
## Cyclotron 18



Cycle three pieces so that  
Black is in checkmate.

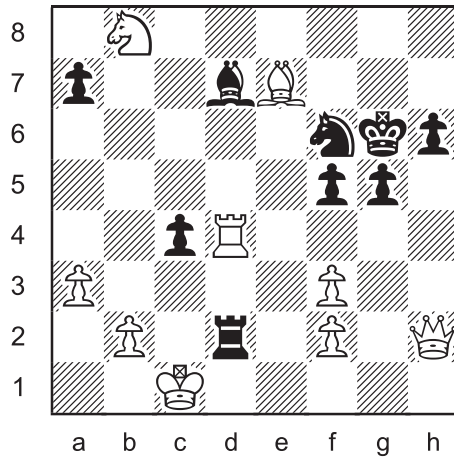
All the cyclotrons in this column share a common “zero position”.  
Only one or two pieces are different in each diagram.

## Cyclotron 19



Cycle three pieces so that  
Black is in checkmate.

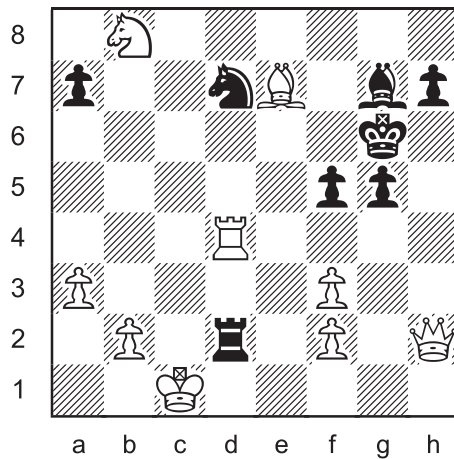
## Cyclotron 20



Cycle three pieces so that  
Black is in checkmate.

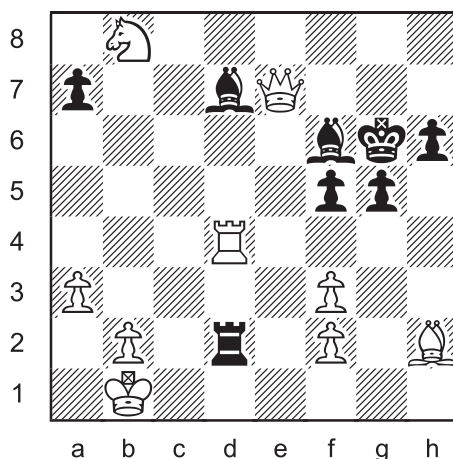


## Cyclotron 21



Cycle three pieces so that  
Black is in checkmate.

## Cyclotron 22



Cycle three pieces so that  
Black is in checkmate.

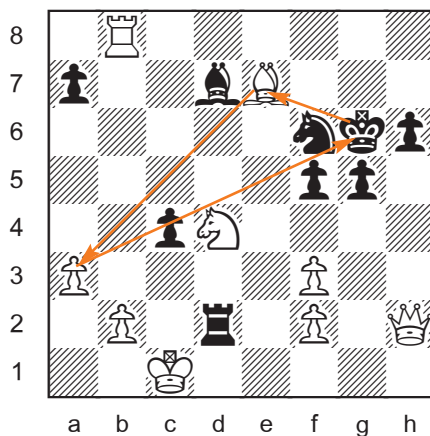
The seven puzzles in this column are part of a much larger set of approximate twins. Stay tuned next month for the second installment of Cyclotronic Overdrive.

## **SOLUTIONS**

All cyclotrons by J. Coakley. *ChessCafe.com* (2015).

*PDF hyperlinks.* You can advance to the solution of any puzzle by clicking on the underlined title above the diagram. To return to the puzzle, click on the title above the solution diagram.

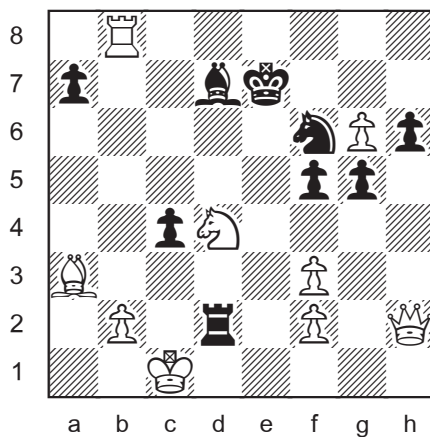
## Cyclotron 16



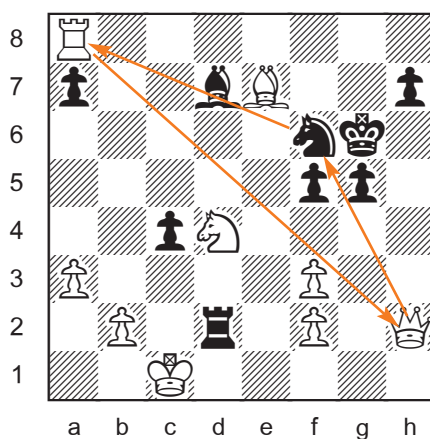
a3→g6 Kg6→e7 Be7→a3

The last move was the discovered check 1.Rb4-b8#.

The order in which the pieces are cycled is not important. The resulting position will still be the same. See diagram below.



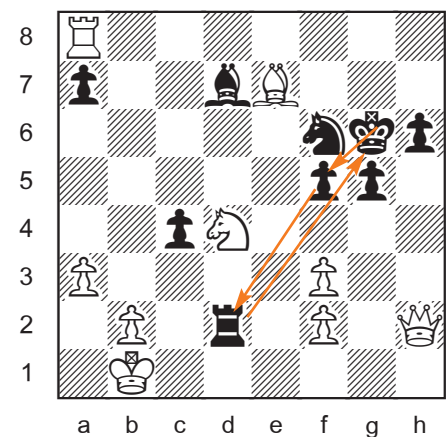
### Cyclotron 17



Ra8→h2 Qh2→f6 Nf6→a8

The cycle a3→g6, Kg6→e7, Be7→a3? is an impossible check.

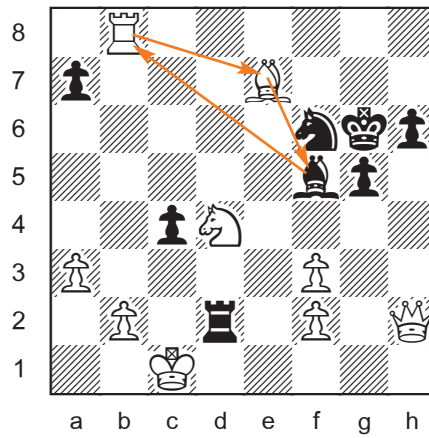
### Cyclotron 18



Rd2→g6 Kg6→f5 f5→d2

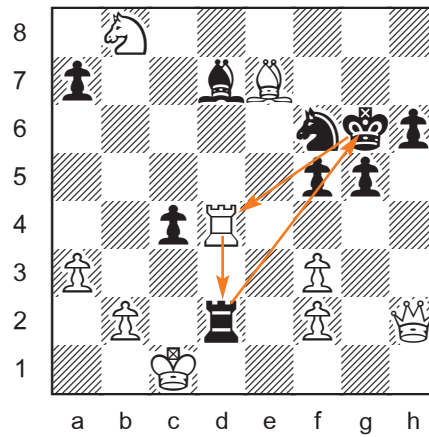
As in the previous puzzle, the cycle a3→g6, Kg6→e7, Be7→a3? is an impossible check.

### Cyclotron 19



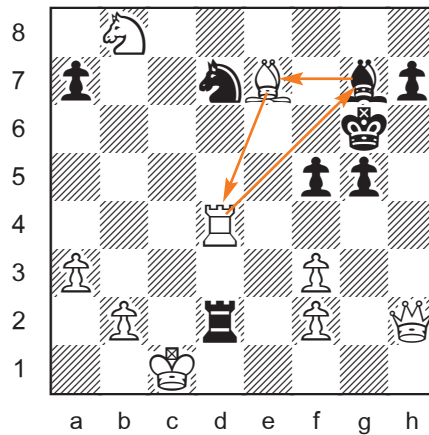
Rb8→e7 Be7→f5 Bf5→b8

### Cyclotron 20



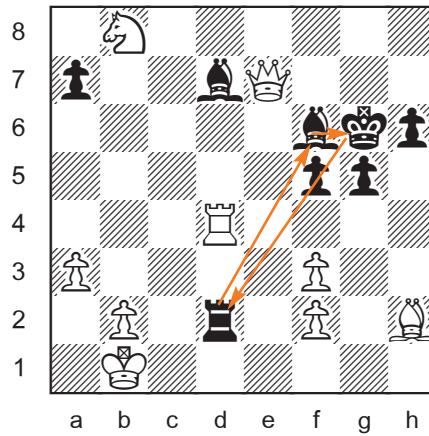
Rd2→g6 Kg6→d4 Rd4→d2

### Cyclotron 21



Rd4→g7 Bg7→e7 Be7→d4

## Cyclotron 22



Rd2→f6 Bf6→g6 Kg6→d2

Until next time!

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